

WHAT IS CLAIMED IS:

1. A semiconductor light-emitting element in which electrodes are formed on a main surface from which light is taken out and on a main surface
5 on an opposite side thereto in a semiconductor substrate, and a roughened surface region whose surface is roughened is formed on at least the main surface around the electrode formed on the main surface from which the light is taken out, wherein
a non-roughened surface region which prevents surface roughening is
10 secured in a peripheral portion of the electrode formed on the main surface from which the light is taken out or in peripheral portions of the electrode formed on the main surface from which the light is taken out and the electrode formed on the main surface on the opposite side thereto.
- 15 2. A semiconductor light-emitting element, comprising:
a semiconductor substrate including a PN junction formed by a first semiconductor region having one conductive type of a P type and an N type and a second semiconductor region having the other conductive type;
a first electrode formed on a main surface in the first semiconductor
20 region of said semiconductor substrate; and
a second electrode formed on a main surface in the second semiconductor region of said semiconductor substrate,
wherein a main surface side in the first semiconductor region is constructed so that light is taken out therefrom, and a roughened surface
25 region whose surface is roughened is formed on at least the main surface around said first electrode,
and a non-roughened surface region which prevents surface roughening is secured in a peripheral portion of said first electrode or in peripheral portions of said first electrode and said second electrode.
- 30 3. A manufacturing method of a semiconductor light-emitting element in which an electrode is formed on a main surface of a semiconductor substrate

from which light is taken out and a roughened surface region whose surface is roughened is formed on at least the main surface around the electrode formed on the main surface from which the light is taken out, said manufacturing method of the semiconductor light-emitting element, comprising:

forming electrodes on the main surface of the semiconductor substrate from which the light is taken out and a main surface on an opposite side thereto;

covering selectively a surface of the electrode on the main surface from which the light is taken out or a surface of the electrode on the main surface on the opposite side to the electrode on the main surface from which the light is taken out with a protective film;

roughening at least the main surface around the electrode on the main surface from which the light is taken out with a non-roughened surface region being left in a peripheral portion of the electrode covered with the protective film by performing a surface roughening treatment from above the protective film; and

removing the protective film which covers the surface of the electrode.

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4. A manufacturing method of a semiconductor light-emitting element comprises:

a semiconductor substrate including a PN junction formed by a first semiconductor region having one conductive type of a P type and an N type and a second semiconductor region having the other conductive type;

a first electrode formed on a main surface in the first semiconductor region of the semiconductor substrate; and

a second electrode formed on a main surface in the second semiconductor region of the semiconductor substrate,

wherein the first semiconductor region is constructed so that light is taken out to a main surface side, and a roughened surface region whose surface is roughened is formed on at least the main surface around the first

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electrode, said manufacturing method of the semiconductor light-emitting element, comprising:

forming the first and second electrodes on one and the other main surfaces of the semiconductor substrate;

5 covering selectively a surface of the first electrode or surfaces of the first and second electrodes with a protective film;

roughening at least the main surface around the first electrode with a non-roughened surface region being left in a peripheral portion of the electrode covered with the protective film by performing a surface
10 roughening treatment from above the protective film; and

removing the protective film which covers the surface of the first electrode or the surfaces of the first and second electrodes.

5. The manufacturing method of the semiconductor light-emitting
15 element according to claim 4, comprising:

covering the surface of the electrode with the protective film;
followed by

dicing step that cuts the semiconductor substrate into chips;
thereafter

20 roughening the surface,
thus, roughening an upper side surface of a chip having the first electrode and the side surface having no electrode at the same time.